

Interest Rate Derivatives: Impacts on Farm Financial Risk and Credit

by Ted Covey¹

The farm credit crisis of the 1980s taught the farm sector the dangers of assuming interest rate stability. Unfavorable movements in interest rates can have negative impacts on farm sector net income and wealth. One highly controversial approach to managing farm sector interest rate risk is derivative contracts: futures, options, and swaps. While derivatives offer farmers protection against unfavorable interest rate changes, their complexity and cost make them more appropriate for the larger financial institutions serving the farm sector. This raises the issue of whether derivatives, like equities, are too risky for banks and Farm Credit System lenders. Also at issue is whether derivatives might compete with farm loans in lenders' portfolios, reducing the amount of credit available to farmers.

Introduction

While the term "derivative" is new and usually associated with financial markets, the farm sector has long been familiar with derivatives such as commodity futures and options.

Derivatives offer the possibility of large speculative gains (or losses). It is the large losses in the quest for large gains that has attracted the most media coverage as well as given derivatives its bad reputation among some groups.

Derivatives also offer inventory managers in the "cash" commodity and financial markets the opportunity to reduce their exposure to unexpected, unfavorable movements in the price of their product. For example, commodity futures offer farmers, cattle feeders, or grain-elevator operators the opportunity to hedge or reduce the risk of unanticipated adverse movements in the price of their products.

The financial crisis of the 1980s demonstrated that the farm sector was vulnerable to another type of risk: adverse and unanticipated interest rate movements. This article provides an introduction to interest rate derivatives and considers how they might affect lender financial risk as well as the cost and availability of credit to farmers.

Interest Rate Risk

Interest rate risk is the result of unexpected, adverse movements in future interest rates that can decrease a farmer or lender's future income or net worth. Unanticipated or unexpected means the difference between the rates the lender expected to pay and the actual rates paid. One study found that a 1-percentage point change in interest rates would change net farm income by 10 percent (Drabenstott and Heffernan).

Farmers face risks from unanticipated increases in interest rates. If a farmer is holding a variable rate loan, the farmer bears the risk that interest rates will increase more than anticipated, resulting in higher than planned future interest

expenses. Farmers' investments in financial securities will decline in value as interest rates unexpectedly rise.

Farmers also face interest rate risk when taking out a fixed rate loan. As borrowers, the risk is that interest rates will subsequently decline and farmers will be paying higher interest expenses than if the loan had been made at a later date.

Lenders also face interest rate risk. One way they might handle risk is to match the maturities of their assets (e.g. loans) and liabilities (e.g. certificates of deposit). Derivatives offer an alternative way of reducing their interest rate risk exposure.

To the lender making a fixed rate loan and borrowing short while lending long (i.e. the maturities of their loans are longer than their deposits), unexpectedly higher interest rates mean lower than expected profits or even a loss.

Farm asset values are also affected by interest rate movements. Farm assets, especially land, are alternative investments to financial assets. Asset values usually decline as interest rates increase, as occurred in the early 1980s. An unplanned increase in interest rates would increase farmer interest rate expenses while decreasing the value of the asset acting as the loan's collateral. This hits the farm sector with an unpleasant "double whammy."

Interest Rate Derivatives

The three primary types of derivatives are futures, options on futures, and swaps. Futures and options are standardized contracts traded in centralized, organized markets such as the Chicago Board of Trade. Swaps are custom-designed by their users to meet their specific financial situation and are traded in the over-the-counter market.

An interest rate futures contract is bought or sold through a broker and obligates the holder to deliver or take delivery of some debt security, e.g. a Treasury bond, at a specified future delivery period at an agreed upon price.

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Options on interest rate futures give the holder the right without obligation to buy or sell a futures contract at a specific price (called the exercise or strike price) within a given period. An option to buy is called a “call,” and an option to sell is called a “put.” The holder has the “option” to simply let the option expire without taking a position in futures if interest rates fail to move as the option-holder had hoped or feared.

When used as a risk-management tool, options lock-in a floor or cap on a price or interest rate, acting as a sort of insurance policy. The option holder (e.g. a farm lender) is willing to accept a known loss (the cost of the option or premium) to be protected for the possibility of a greater loss.

Interest rate swaps are a more recent innovation and thus less familiar to the farm sector. For example, swaps involve two lenders “swapping” or exchanging the cash flows from two loans. Usually this involves a lender(s) with a fixed rate loan swapping his or her cash flows on predetermined settlement dates with a lender(s) who holds a variable rate loan with the same principal amount. Usually only the net interest payments are exchanged. Swaps are created when the users feel their financial needs are not met by futures and options. Unlike futures and options, swaps do not have an active resale market or a clearinghouse to guarantee performance of the contract’s requirements. This greatly increases the liquidity and credit risk associated with their use.

Who Uses Interest Rate Derivatives?

Large lenders such as large commercial banks, life insurance companies, and Farm Credit Banks (FCBs) are the primary users of interest rate derivatives. Derivatives are more appropriate for large lenders who can develop the expertise and allocate time to monitor them.

The Derivatives Work Group of the Farm Credit Administration (FCA) reported that most FCBs use only interest rate swaps. The report noted that as of December 31, 1994, FCBs held \$13 billion in derivatives with a credit risk exposure of \$60 million. This \$60 million is relatively small in contrast to the FCS’s credit risk exposure from its \$60 billion in loans.

The ten U.S. commercial banks with the largest dollar amount of derivative contracts outstanding for the same time held \$14.5 trillion with a credit risk exposure of \$138 billion. This represented almost a tripling of bank involvement in derivatives from 1990 to 1995.

How Can Lenders and Farmers Use Interest Rate Derivatives?

Lenders or farmers can use interest rate derivatives to protect the value of their portfolios against adverse interest rate movements. For example, a lender who has made long-term, fixed-rate real estate farm loans financed by shorter-term variable cost funds or a farmer who has invested in long-term bonds can sell interest rate futures or buy interest rate puts. A subsequent increase in interest rates that reduces the value of the lender’s and farmer’s portfolio will be offset by the increase in the value of the farmer or lender’s position in futures or options. According to the FCA, the FCS uses swaps

to match cash in-flows from its loans to the cash out-flows on its securities used to raise funds.

A study at Temple University showed that the Bank for Cooperatives can use Treasury bill futures to hedge against unanticipated increases in its 6-months ahead borrowing costs (Severn).

Farmers could sell interest rate futures to offset losses on variable rate loans resulting from increases in interest rates. Given an increase in interest rates, the profit from the futures position at the time of the loan rate’s adjustment would compensate the farmer for the higher loan rate. However, this simple scenario is complicated by: futures margin requirements, futures mark-to-market feature (in futures markets, traders are required to make payments in cash on any losses by the end of the trading day on which they occur), the large size of futures contracts in contrast to the smaller loan needs of most farmers, that farm loans do not have exact, corresponding futures contracts, and the mismatch between the maturities of interest rate futures contracts and farm loans. While options mitigate some of these problems, some farmers may prefer entering into an interest rate swap agreement with their lender.

Lenders can act as brokers or counterparties for agribusinesses in interest rate swaps. As brokers, lenders match their customers with others who have offsetting financial needs. This is often difficult. Thus, more often lenders assume the counterparty’s role, profiting for their services by paying or receiving more than a non-lender counterparty would.

Interest rate caps protect farmers against unexpected increases in interest rates by paying the farmer the difference whenever the loan rate exceeds the cap rate. Interest rate floors protect the lender against unplanned large decreases in interest rates.

Farmers holding variable rate loans can protect themselves against adverse interest rate movements by purchasing from a lender an over-the-counter derivative called an interest rate collar. Collars are created when a farmer-borrower simultaneously purchases a cap and sells a floor to the lender. Interest rate collars establish a range within which the loan’s rate may move regardless of changes in the loan’s index rate. While selling a floor means the farmer foregoes savings if interest rates subsequently fall below the floor rate, the initial payment the farmer receives for the floor offsets the cost of the cap.

Derivatives provide lenders revenue sources beyond their traditional operations. Managing derivatives for farmer-clients allows a lender to handle a wider range of the farmer’s financing needs while reducing the potential for interaction between the farmer and the lender’s competitors.

Lenders and Derivatives: Risky Business?

An issue currently under debate is whether derivatives, like stock ownership, are too risky for banks. Recent and heavily publicized financial disasters such as England’s Barings Bank and Orange County’s bankruptcy have raised concerns that financial derivatives create more risk than they solve.

Economists divide the risks arising from derivatives into several classes: liquidity, credit, price, operating, valuation, regulatory, and systemic.

Liquidity risk is the probability a loss will occur because the derivative must be sold immediately. This is a particular problem for over-the-counter derivatives like swaps.

Credit or default risk is the probability of default by one of the parties to a derivative contract. The existence of a clearinghouse and margin requirements eliminates credit risk for futures and options. Credit risk is especially relevant for swaps. This risk can be mitigated by a lender's careful evaluation and monitoring of the other party's creditworthiness and by requiring collateral. The use of netting agreements, which stipulate that all of a lender's derivative contracts with the other party are closed out if that party defaults on any one derivative contract, has been a popular way to reduce credit risk exposure.

Price risk is the probability that the derivative's value may decline over time. For example, the FCS showed an unrealized loss of \$107.6 million due to adverse interest movements' effect on the value of its derivative holdings. However, it is misleading to consider the price risk of derivatives alone, especially if the derivatives are being used to reduce the lender's overall portfolio price risk.

Operating risk is concerned with monitoring and controlling the assumption of risk on behalf of the firm by its representatives. Because of the complexity of derivatives and their potential volatility, the cost of excessive risk taking, ignorance, and human error can be exorbitant. The collapse of Barings Bank and Orange County California's bankruptcy are examples.

Valuation risk is the problem of assigning a value or price to a derivative or any asset that trades infrequently, such as an interest rate swap. The value of these derivatives or assets is calculated using mathematical models based on assumptions of underlying market conditions. If these assumption do not hold, the models generate unrealistic valuations.

Regulatory risk is the probability that regulators' treatment of derivatives might change in the future. Regulatory risk is higher for derivatives, especially swaps, because of their relative newness, rapid evolution, and complexity.

Systemic risk causes policy makers and regulators the greatest concern. This is the chance that the financial failure by one or more derivative market participants could cause a chain reaction throughout the financial markets. One preliminary study found although the banking system had a large exposure to interest rate increases, it seemed to have hedged most of the risk at the time of their study (Gorton and Rosen).

Derivatives: Impact on Farm Credit

A concern of policy makers is the effect derivatives might have on credit availability and cost in the farm sector. One argument against lender involvement in interest rate derivatives is that they would replace farm loans in the lenders' portfolio. Proponents respond that derivatives allow lenders to reduce their risk in farm lending while managing their portfolios' overall interest rate risk exposure, increasing the growth rate in loans to agriculture. If so, regulatory constraints on lender involvement in derivatives could reduce future growth in farm lending.

Conclusions

The current situation of relatively stable low interest rates may lure the farm sector into a sense of apathy towards interest rate risk management. The experience of the farm sector in the 1980s demonstrated the risks that come from making farm debt decisions on the assumption of stable interest rates. Derivatives offer an alternative to relying on one's interest rate predictions. If government continues to withdraw from the farm markets, and given the current trend toward larger farms and lenders, derivatives will probably become an increasingly used risk management tool. The well-publicized financial disasters in the private and government sectors is an advance warning to agriculture that derivatives are a double-edged sword.

References

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